ACTION MEMORANDUM

SUBJECT: DATE

TO: ☐ LIFE SCIENCES ☐ BIOASTRONAUTICS ☐ SURGEON

REPORT BACK:

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ORD-OSA COORDINATING CONFERENCE

LIFE SCIENCES R,D,T,&E. ORQ's & PROJECTS

STAT [redacted] - ORD. 28 DEC 65

STAT [redacted] RESEARCH CONSULTANT/ PHONE [redacted] STAT

SUBJECT: AGENDA FOR MEETING OF ORD-OSA COORDINATING GROUP ON LIFE SCIENCES R&D PROJECTS. 606 AMES BLDG: 5 APRIL 1966.

TO: PARTICIPANTS AND FOR THE RECORD.

ITEM 1. Review and discuss briefly developements and/or progress made in the following projects since last full meeting on 28 December 65.

a. BT-2 'Critical pilot overloads during mission' - results of test flights.

b. BT-4 Cockpit ECS - hot decelerations pose prime problem now; several approaches, but none appear completely satisfactory.

c. BT-6 'Crew Protective Assemnly' - faceplate reflectance & hot face; PPG failure; P-E & O-C trying.

d. BT-8 'Crew training & Indoctrination'- still no centralized authority and coordinated medical responsibility & record keeping.

e. BT-11 (g) 'Biomed Monitoring' - largely status quo but some of the NASA-Edwards work sjows some slight promise. Need a new approach and significant break through badly.

f. BH-1,2,3. 'Psychological Assessments on Applicant Trainees' - refer to Letter this office Subject: Planning Conference ---- held in [redacted] office 1 April 66; and also Ltter this office Subject: Discussion items for conference with [redacted] STAT STAT on same date. NOTE: The extent and detail to which this item is subjected to discussion to be determined by [redacted] STAT

ITEM 2. Brief review and discussion on the current status of OSA Systems Planning. CHECK CLEARANCES

a. OX Project

b. ID Project

STAT c. [redacted] Project

ITEM 3. Continue OSA Biomedical Sciences Projects review and discussion.

ITEM 4. Miscellaneous topics for discussion if time permits & spirits are willing.

a. Urgent need for standardized documentation & data handling system.

b. Greater use of 'expert' consultants on specific L/S problems. HE especially.

c. Periodic sponsoring of symposia covering high priority areas of interest.

[redacted] ILLEGIB

	PROJECT	OPERATIONAL REQUIREMENT	STATUS
BM-1	Medical Criteria for Selection and Maintenance	Flying Fitness and Survivability SAM Low-Level Strict control — alcohol, drugs, tobacco	12 year record NASA-AF-Special Projects No unusual criteria or correlations.
BM-2	Psychophysiologic Factors in Stress Tolerance	Pilot Performance Under All Mission Conditions	Physical fitness, work tolerance, pulmonary funct. motivation, experience and adaptability.
BM-3	Measurable Indices of Mission Stress and Fatigue	Crew Control and Maintenance	Inadequate Test Battery Subjective criteria only found useful.
BM-4	Mission Metabolic Costs and Nutritional Requirements	Crew Control and Maintenance	Weight loss varies with temp. control. high protein diet preferred dehydration-constant
BM-5	Diurnal Biorhythm Alteration	24 hour mission alert Crew control and maintenance ~~5 day~~ 36 hour - 56 hour recycle	Large variation in individu adaptability. Controlled environment requ further study.
BM-6	Thermoregulatory system function & heat adaptation.	Performance during emergency heat stresses in flight.	Environmental & vehicle parameters not well-defined Large individual variation in tolerance.

BIOMEDICAL SCIENCES

	PROJECT	OPERATIONAL REQUIREMENT	STATUS
BM-7	In-flight Pulmonary Function.	Index of pilot status during Mission.	O_2 utilization rates correlate with Mission performance.
BM-8	Acoustic trauma and auditory function.	Accurate Communications and future flying fitness.	Potential acoustic hazards not well-defined. HF auditory acuity impaired.
BM-9	Visual and Vestibular Function	Intra- & Extra-vehicular Orientation. Night vision training. & light system	Disorientation during re-fueling. Faceplate Reflectance. see BT-6
BM-10	Toxicology of Artificial Environments	Elimination of liquid/gaseous contaminants Aeromed Div SAM	No comprehensive survey of the problem.
BM-11	Radiobiologic hazards	Identification of Acute and Chronic Biologic Effects	
	a- Survey of existing data		Extrapolations indicate no hazard acute.
	b- Instrumentation	Establish exposure dosage	None
	c- Study of Chronic effects (genetic karyotyping)	Personal futures.	None (questionnaire to 'I' Project Pilots not contributory)
	d- Prophylaxis & treatment.	Future Special Projects, Check on RF - Radar Hazards	Following literature; no significant breakthroughs.

	PROJECT	OPERATIONAL REQUIREMENT	STATUS
BM-12	Influence of HPF on disease incidence and aging process.	Contribution to Current N.I.H. and F.A.A. Studies.	No significant findings and/or correlations.
BM-13	Medical Care and Services a - Clinical Medicine b - Preventive Medicine c - Emergency Care- Disasters	Group Health and Morale Isolated Bases Reduce Environmental Hazards. Auto-medication	Family Units not integrated. Improved training and diagnostic technics. Poorly organized. Little effort.

	PROJECT	OPERATIONAL REQUIREMENT	STATUS
BH-1	Psychological Assessments of Individual Applicants.	Improve Selection Procedures	Dr. Geo. Ruff's experimental method of assaying. Motivational depth shows considerable promise. Past result have been excellent.
BH-2	Group Behavioural Studies (Med. Dept.)	Improve overall evaluations	Results compare favorably with other methods.
BH-3	Familial and Social Interactions and Studies.	Continuous Assessments	Many constraints on carrying ou any significant program.
BH-4	Personnel Training &Evaluation a-Pilot integration with vehicle & components b-Personal protective equipment c-Survival;self-medical care. d-Escape, evasion & resistance	Pilot performance, safety & survivability.	Objectives & efforts in this area largely uncoordinated. primarily OJT. Indoctrination & OJT. Standard course. Outside Aeromed Cognizance.

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BEHAVIOURAL SCIENCES

PROJECT	OPERATIONAL REQUIREMENT	STATUS
H-5 Psychological factors in special missions.	Pilot effectiveness and integrity.	Wide divergence of opinion- no consolidated effort.
H-6 Personal & familial factors in dislocations.	Alleviation of economic and career problems.	No directed effort.

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	PROJECT	OPERATIONAL REQUIREMENT	STATUS
BT-1	Cockpit Design, Controls, Displays	Optimal System- Pilot Integration for Performance and Safety.	Barely adequate compromise see BT-5.
BT-2	Mission Task Analysis and Evaluation	Eliminate Critical Pilot Overloads If any major system fails, abort.	Fly and Try. Auto Systems Reliability Key Factor.
BT-3	Crew Training and Task Simulation ✗	Optimal Crew Peformance and Safety. now have Mk. II simulator!	No Simulators OJT - 2 place vehicle Tech Reps. on sub-systems see BT-8.
BT-4	Cockpit Environmental Control System	Habitable Workspace Reliable Breathing O_2 System. High Hot Decelerations still a problem	No Isothermal Balance Further Study Required 100% redundancy and duality.
BT-5	Emergency Crew Ejection and Recovery System	Crew Safety	Supersonic, high and low altitude capability.

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	PROJECT	OPERATIONAL REQUIREMENT	STATUS
BT-6	Crew Protective Assembly	Omni-environmental Protection	All OR's Met; Continued Mod. Improvements.
	a-helmet sub-system X	max protection and visibility	faceplate reflectance.
	b-pneumatic s/s	oxygenation, pressurization, and ventilation.	thermal inbalance.
	c-emergency s/s	oxygenation, pressurization, and ventilation on ejection. PPS failed Perkin Elmer - cold power - plastic optical coating - work on visor	two wet runs - all systems functioned. solved if visor [illegible]
T-7	Crew Survival Assembly a- parachute s/s b- seat pack s/s c- locator & air snatch s/s	Pilot Recovery and Integrity safe descent & detection survival, escape and evasion recovery in denied areas	Borderline on Volume and Weight. (non-detection) untested. component improvements. radio marker only.
T-8	Crew Training& Indoctrination a- survival b- escape and evasion X c- project security	Pilot Recovery and Integrity Training Technology	Parasail Training Food, water, Med supplies adequate. No Aeromed responsibility.
T-9	Mission Monitoring Equipment [redacted] a- vehicle b- propulsion c- components d- environment e- pilot & protective assembly	Mission Critical Factor Analysis. Accident Analysis.	Good Data Returns except for human parameters. Further directed effort required.

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BT-10	Aircrew Control and Conditioning Center Physical Rhythms X ~~isolate~~ measure his phase simulate daytime voice environments	Optimal Mission Fitness only active pilot response perception loss;	Initial Concepts Under Re-evaluation. speech stress
BT-11	Mission Ground Life Support Equipment. a- FPS & O_2 test s/s b- Pre-breathing s/s c- Portable O_2 & vent s/s X d- Van-transport s/s e- Van- maintenance s/s f- Van-physiol.chamber s/s g- Biomed. monitoring	Pre-Mission Crew Preparation, Test and Delivery Periodic Physiological training. Poor definition → what's the problem?	Fulfills all OR's. Inadequate
BT-12	Crash Medical Equipment a- surface operations b- airborne operations	Pilot Location, Medical Aid and Recovery. locate	Standard Air Force Medic Vehicles and Equipment. Paramedic equipment.